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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/533,370

04/29/2005

Michael R. Watts

MIT-170

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09/19/2006

GOODWIN PROCTER LLP  
PATENT ADMINISTRATOR  
EXCHANGE PLACE  
BOSTON, MA 02109-2881

EXAMINER

WONG, TINA MEI SENG

ART UNIT

PAPER NUMBER

2874

DATE MAILED: 09/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/533,370

**Applicant(s)**

WATTS ET AL.

**Examiner**

Tina M. Wong

**Art Unit**

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9, 11, 12 and 15-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 5, 6, 8, 12 and 18 is/are rejected.
- 7) ☒ Claim(s) 2-4, 7, 9, 11 and 15-17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4/29/05, 10/11/05, 11/7/2005
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Priority*

Receipt is acknowledged of papers submitted by the International Bureau under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1, 5, 6, 8, 12 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,243,699 to Alferness et al.**

In regards to claims 1 and 18, Alferness et al discloses a polarization converter comprising a plurality of cores layers (21, 22, 23) that transforms a propagating mode from an initial polarization to a different final polarization state (Column 3 Lines 30-31, 40-44, 54-57). (Figure 2)

The Examiner notes that the limitation “configured to (geometrically) approximate a gradually twisted waveguide” does not define any structure. The prior art meets the structural limitations of the claim. An apparatus claim must be structurally distinguishable from the prior art. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function (*In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997); See MPEP 2114 [R-1]). A claim containing a “recitation with respect to the manner in which a

claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus if the prior art apparatus teaches all the structural limitations of the claim (*Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987); see MPEP 2114 [R-1]).

The functional recitation of “configured to (geometrically) approximate a gradually twisted waveguide” has not been given patentable weight because it is narrative in form. In order to be given patentable weight, a functional recitation must be expressed as a “means” for performing the specified function, as set forth in 35 U.S.C. § 112, 6<sup>th</sup> paragraph, and must be supported by recitation in the claim of sufficient structure to warrant the presence of the functional language (*In re Fuller*, 1929 C.D. 172; 388 O.G. 279).

Additionally, Alferness et al fails to specifically disclose the transformation of the propagating state to be adiabatic. However, adiabatically transforming polarization state is advantageous. By adiabatically transforming the polarization states, there is no loss of signal between the transformation. Furthermore, Alferness et al applied the use of perturbation sections in layers to rotate the polarization. By using the perturbation sections, the waveguide simply travels through the sections to transform polarization states, and therefore, no physical movement of the components occur to create a loss of signal. Therefore, although not explicitly stated, Alferness et al does suggest adiabatically transforming polarization states.

In regards to claim 5, Alferness et al shows three core layers (21, 22, 23). (Figure 2)

In regards to claim 6, Alferness et al shows the cross section the core layers to be maintained constant along a length of the polarization converter.

In regards to claim 8, Alferness et al disclose a method of using a polarization converter comprising the step of receiving an initial polarization state and forming a plurality of core layers

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(21, 22, 23) that transforms a propagating mode from an initial polarization to a different final polarization state (Column 3 Lines 30-31, 40-44, 54-57). (Figure 2)

The Examiner notes that the limitation “configured to approximate a gradually twisted waveguide” does not define a step in the method. A claim containing a recitation with respect to the manner in which a claimed method of using the apparatus is intended to be employed does not differentiate the claimed method from a prior art method if the prior art apparatus teaches all the step limitations of the claim (*Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987); see MPEP 2114 [R-1]).

The functional recitation of “configured to approximate a gradually twisted waveguide” has not been given patentable weight because it is narrative in form. In order to be given patentable weight, a functional recitation must be expressed as a “means” for performing the specified function, as set forth in 35 U.S.C. § 112, 6<sup>th</sup> paragraph, and must be supported by recitation in the claim of sufficient structure to warrant the presence of the functional language (*In re Fuller*, 1929 C.D. 172; 388 O.G. 279).

Additionally, Alferness et al fails to specifically disclose the transformation of the propagating state to be adiabatic. However, adiabatically transforming polarization state is advantageous. By adiabatically transforming the polarization states, there is no loss of signal between the transformation. Furthermore, Alferness et al applied the use of perturbation sections in layers to rotate the polarization. By using the perturbation sections, the waveguide simply travels through the sections to transform polarization states, and therefore, no physical movement of the components occur to create a loss of signal. Therefore, although not explicitly stated, Alferness et al does suggest adiabatically transforming polarization states.

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In regards to claim 12, Alferness et al shows three core layers (21, 22, 23). (Figure 2)

*Allowable Subject Matter*

**Claims 2-4, 7, 9, 11 and 15-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.**

In regards to claims 2, 3, 9, 15, 16 and 17, the prior art of record fails to disclose or reasonably suggest at least one of the core layers to be tapered linearly or along the length of the polarization converter. Although Alferness et al does show in Figure 6C the core layers (22, 23) to be a different width than the third core layer (21), Alferness et al does not disclose or suggest a **tapered** core layer. Alferness et al merely shows a distinct immediate difference in the core widths.

In regards to claims 4 and 11, the prior art of record fails to disclose or reasonably suggest the plurality of cores to consist of two layers. Alferness et al shows in all of the Figures and explains in all of the embodiments three distinct core layers. Alferness et al does not suggest or teach the use of two layers.

In regards to claim 7, the prior art of record fails to disclose or reasonably suggest the core layers to be separated laterally along the length of the polarization converter. Alferness et al shows in all of the Figures and explains in all of the embodiments the three core layers to be directly touching on top of each other. Furthermore, in order for Alferness et al to convert the polarization state, the input signal must travel through the cores and into the perturbation section.

### ***Prior Art***

The documents submitted by applicant in the Information Disclosure Statements have been considered and made of record. Note attached copies of forms PTO-1449. None of the documents submitted by Applicant discloses or reasonably suggests the allowable subject matter discussed above.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Reference B (Vahala et al) discusses twisting a waveguide in order to change the polarization state. However, Vahala et al does not teach a plurality of core layers. The Non-Patent Literature (Oh et al) cited by the Examiner also discusses the twisting of waveguides in order to change the polarization state, but Oh et al also fails to teach a plurality of core layers.

### ***Inventorship***

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

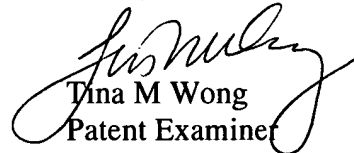
### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tina M. Wong whose telephone number is (571) 272-2352. The examiner can normally be reached on Monday-Friday 8:30-5:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Tina M Wong  
Patent Examiner